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# DOCUMENTATION OF DUE CARE COMPLIANCE

24800 Haggerty Road | Farmington Hills, Michigan
PM Project Number 01-6348-0-0002

*Prepared for:*

**Luna Entertainment**
42875 Grand River Avenue, Suite 201
Novi, Michigan 48375

*Prepared by:*

**PM Environmental, Inc.**
4080 West 11 Mile Road
Berkley, Michigan 48072

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February 23, 2016

Mr. James Oegema
Luna Entertainment
42875 Grand River Avenue, Suite 201
Novi, Michigan 48375

**RE: Documentation of Due Care Compliance for the Former Sam's Club Property Located at 24800 Haggerty Road, Farmington Hills, Michigan**
**Parcel ID: 22-23-19-326-056**
**PM Environmental, Inc. Project No. 01-6348-0-0002**

Dear Mr. Oegema:

Enclosed is one copy of the Documentation of Due Care Compliance (DDCC) prepared by PM Environmental, Inc. (PM) in accordance with Section 21304c of P.A. 451, as amended.

**THIS DOCUMENTATION OF DUE CARE COMPLIANCE WAS PERFORMED FOR THE EXCLUSIVE USE OF OAKLAND COUNTY, LUNA ENTERTAINMENT, CVRS, L.L.C. AND CELANI FAMILY LLC, EACH OF WHOM MAY RELY ON THE REPORT'S CONTENTS.**

If you have any questions regarding the information in this report, please contact us at 248.336.9988.

Sincerely,
**PM ENVIRONMENTAL, INC.**

Aaron Snow
Staff Scientist

Jennifer Ritchie, CPG
Regional Manager

Enclosure

**TABLE OF CONTENTS**

## FIGURES



## TABLES



## APPENDICES

## 1.0 INTRODUCTION

This Documentation of Due Care Compliance (DDCC) was prepared on behalf of Celani Family LLC for the former Sam's Club property (Parcel ID: 22-23-19-326-056) located at 24800 Haggerty Road, Farmington Hills, Oakland County, Michigan 48335 (hereafter referred to as the "subject property"), in accordance with Section 20107a of Part 201 of the Natural Resources and Environmental Protection Act (NREPA), P.A. 451 of 1994, as amended. Documentation, including this DDCC, is to be maintained demonstrating that the subject property is in compliance with Section 7a of Part 201. Documentation, which includes this report and related materials, must be made available to the Michigan Department of Environmental Quality (MDEQ) upon request.

Section 7a of Part 201 imposes the following obligations for contaminated properties:

(a) Undertake measures as are necessary to prevent exacerbation.

(b) Exercise due care by undertaking corrective action necessary to mitigate unacceptable exposure to regulated substances, mitigate fire and explosion hazards due to regulated substances, and allow for the intended use of the property in a manner that protects the public health and safety.

(c) Take reasonable precautions against the reasonably foreseeable acts or omissions of a third party and the consequences that foreseeably could result from those acts or omissions.

(d) Provide reasonable cooperation, assistance, and access to the persons that are authorized to conduct corrective action activities at the property, including the cooperation and access necessary for the installation, integrity, operation, and maintenance of any complete or partial corrective action activity at the property.

(e) Comply with any land use or resources use restrictions established or relied on in connection with the corrective action activities at the property.

(f) Not impede the effectiveness or integrity of any land use or resource use restriction employed at the property in connection with corrective action activities.

This DDCC is representative of the current and intended use as outlined in Section 1.1 and 1.2. If changes to the property use, zoning, operations, and/or layout occur, re-evaluation of potential exposure pathways and associated amendments to this report may be required.

### 1.1 Site Description and Background

The subject property consists of one parcel totaling 9.77 acres, and is located between Haggerty Road and I-275, north of Grand River Avenue (Figure 1). The subject property is developed with one single-story 104,583 square foot retail building, and is currently vacant (Figure 2). The remainder of the property primarily consists of asphalt and concrete paved areas.

Review of historical sources indicates the subject property was developed prior to 1940 with agricultural fields and a northeast trending irrigation ditch in the central portion of the subject property. Several small structures, which were likely associated with residential activities on the north adjoining property, were constructed in the northern portion of the subject property at

various times between 1940 and 1963 and demolished at various times between 1956 and 1974. Agricultural activities ceased and a residential dwelling was constructed in the southwestern portion of the subject property between 1956 and 1963. The northern portion of the subject property was utilized for automotive salvage operations associated with the north adjoining property between 1967 and 1974. A commercial building, which was occupied by a construction company, was constructed in the northwestern portion of the subject property between 1974 and 1980. Automotive salvage operations ceased, the buildings were demolished, and the irrigation ditches were filled between 1983 and 1989, and the current building was constructed in 1989.

### 1.2 Intended Use of the Subject Property

Celani Family LLC intends to redevelop the subject property for commercial purposes, which will include a motorcycle dealership and training facility, a restaurant, a drive-in movie theatre, and a grocery market. No significant chemical use and storage greater than household quantities are anticipated on the subject property. The subject property is currently zoned for B-3: General Business District, which is consistent with a Nonresidential property use.

The subject property is currently connected to municipal water, sanitary sewer, natural gas, electrical, and telecommunications utilities.

### 1.3 Summary of Previous Site Investigations

PM reviewed the following previous environmental reports completed for the subject property.

| Name of Report | Date of Report | Company that Prepared Report |
|---|---|---|
| Phase I Environmental Site Assessment (ESA) | 2-29-2008 | Summit Environmental Services LLC (Summit) |
| Phase II ESA | 10-10-2008 | Summit and ECI Environmental Compliance (ECI) |

Copies of the previous Phase I ESA and Phase II ESA completed in 2008 are included in Appendix C of PM's December 2015 Phase I ESA issued under separate cover.

The previous Phase I ESA was completed in 2008, at which time the subject property was occupied by Sam's Club. The 2008 Phase I ESA identified the following recognized environmental condition (REC):

- The north adjoining property was historically occupied by an automotive salvage yard from between 1967 and 1974 to between 1983 and 1989, which extended onto the northern portion of the subject property. The potential exists for spills, leaks, and/or dumping of general hazardous substances and/or petroleum products to have occurred on the subject property and to have negatively impacted the subsurface.

The 2008 Phase II ESA was completed to assess the above REC. Site assessment activities included the advancement of 10 soil borings (B1 through B6 and B9 through B12), the installation of 10 temporary monitoring wells (TMW1 through TMW6 and TMW9 through TMW12), and the collection of 10 soil samples and six groundwater samples for laboratory analysis of volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PNAs), polychlorinated biphenyls (PCBs), and Michigan ten metals (arsenic, barium, cadmium, chromium, copper, lead,

mercury, selenium, silver, and zinc), or some combination thereof. A summary of soil and groundwater analytical results from the 2008 Phase II ESA is included in sections 2.1 and 2.2.

## 1.4 Summary of Current Site Investigation

### 1.4.1 2015 Phase I ESA

PM performed a Phase I ESA for the subject property dated December 11, 2015, in conformance with the scope and limitations of ASTM Practice E 1527-13 (i.e., the 'ASTM Standard'). A copy of PM's December 2015 Phase I ESA is included in Appendix A of PM's February 2016 Baseline Environmental Assessment (BEA), which was issued under separate cover.

The following onsite REC was identified in PM's December 2015 Phase I ESA:

- The north adjoining property was historically occupied by an automotive salvage yard from 1963 to 2000 with salvage operations extending onto the northern portion of the subject property from 1967 to 1989. Previous site investigations completed for the subject property in 2008 identified concentrations of 1,2,4-trimethylbenzene, naphthalene, and/or various metals in the soil and groundwater above the current Part 201 Residential and Nonresidential cleanup criteria in the northern portion of the subject property. Based on analytical results, the subject property is classified as a facility as defined by Part 201 of P.A. 451 of the Michigan NREPA, as amended.

No adjoining and/or nearby RECs were identified:

### 1.4.2 2016 Phase II ESA

PM completed a BEA (issued under separate cover) for the subject property dated February 15, 2016, to assess the REC identified in PM's December 2015 Phase I ESA. The BEA documented the subsurface investigation activities outlined below:

Prior to the commencement of field activities, MissDig, a utility locating service, was contacted to locate utilities on or adjacent to the subject property. Utilities were marked by the respective utility companies where they entered or were located adjacent to the subject property.

On January 27, 2016, PM conducted subsurface investigation activities at the subject property consisting of the advancement of ten soil borings (SB-1 through SB-10), the installation of five temporary monitoring wells (TMW-1, TMW-3, TMW-5, TMW-7, and TMW-9), and the collection of six soil samples and five groundwater samples for laboratory analysis of VOCs, PNAs, PCBs, and Michigan ten metals, or some combination thereof. Soil boring/temporary monitoring well locations are depicted on Figures 3 and 4.

## 1.5 Geology and Hydrogeology

Based on review of the soil boring logs, the soil stratigraphy generally consists of sand and/or clayey sand to approximately 14.0 feet below ground surface (bgs), underlain by clay to a depth of at least 20.0 feet bgs, the maximum depth explored. Perched groundwater was encountered in all 10 of the soil borings advanced at the subject property at depths between 5.0 and 11.0 feet bgs. Black soils were identified at SB-1, SB-2, and SB-7 at depths between 1.0 and 11.0 feet bgs. Additionally, wood debris was identified at SB-2 between 1.5 and 9.0 feet bgs.

Based on the absence of water wells in the area and the connection to municipal water, the drinking water exposure pathway is not complete. Therefore, the Drinking Water Protection (DWP) and Drinking Water (DW) cleanup criteria are not applicable to the subject property.

## 2.0 LOCATION OF CONTAMINATED MEDIA ON THE SUBJECT PROPERTY

PM compared the analytical results of soil and groundwater samples collected by Summit and ECI in 2008 and by PM on January 27, 2016 with the MDEQ Generic Cleanup Criteria and Screening Levels as presented in Part 201 Rules 299.1 through 299.50, dated December 30, 2013 entitled "Cleanup Criteria Requirements for Response Activity", in accordance with Section 20120a(1) using the Residential and Nonresidential cleanup criteria.

Figures 3 and 4, and Tables 1, 2 and 3 summarize the 2016 analytical results. Relevant figures and tables with analytical results from the 2008 Phase II ESA are included in Appendix A.

### 2.1 Summary of Soil Analytical Results

#### 2.1.1 Summary of Previous Soil Analytical Results

Relevant figures and tables from Summit and ECI's 2008 Phase II ESA are included in Appendix A.

A concentration of 1,2,4-trimethylbenzene was detected in the 2008 soil sample collected from B3-1 (7.0 feet bgs) above the Part 201 Groundwater Surface Water Interface Protection (GSIP) cleanup criteria. No concentrations of VOCs were detected in any of the remaining soil samples collected in 2008 above laboratory method detection limits (MDLs).

A concentration of naphthalene was detected in the 2008 soil sample collected from B3-1 (7.0 feet bgs) above the Part 201 GSIP cleanup criteria. No concentrations of PNAs were detected in any of the remaining soil samples collected in 2008 above laboratory MDLs.

No concentrations of PCBs were detected in any of the 2008 soil samples collected above laboratory MDLs.

Concentrations of arsenic were detected in the 2008 soil samples collected from B2-1 (6.0 feet bgs), B3-1 (7.0 feet bgs), and B10-1 (5.0-6.0 feet bgs) above the Part 201 Residential and Nonresidential DWP, GSIP, and/or Residential Direct Contact (DC) cleanup criteria. Concentrations of mercury and selenium were detected in the 2008 soil sample collected from B3-1 (7.0 feet bgs) above the Part 201 GSIP cleanup criteria. Concentrations of various metals were detected in the 2008 soil samples collected from B2-1 (6.0 feet bgs), B2-2 (3.5 feet bgs), B3-1 (7.0 feet bgs), B4-1 (3.0-4.0 feet bgs), B5-1 (3.0-4.0 feet bgs) and B12-1 (7.0-8.0 feet bgs) above the Statewide Default Background Levels (SDBLs) for soils in Michigan, but below the most restrictive Part 201 Residential cleanup criteria. No concentrations of metals were detected in any of the remaining soil samples collected in 2008 above laboratory MDLs and/or SDBLs.

#### 2.1.2 Summary of Current Soil Analytical Results

PM's January 2016 soil analytical results are summarized on Figure 3 and in Tables 1 and 2.

No concentrations of VOCs were detected in any of the soil samples collected above laboratory MDLs.

Concentrations of various PNAs were detected in the soil sample collected from SB-3 (4.0-5.0 feet bgs) above laboratory MDLs, but below the most restrictive Part 201 Residential cleanup criteria.

No concentrations of PCBs were detected in any of the soil samples collected above laboratory MDLs.

A concentration of arsenic was detected in the soil sample collected from SB-3 (4.0-5.0 feet bgs) above the Part 201 Residential and Nonresidential DWP, GSIP, and Residential DC cleanup criteria. Concentrations of barium, lead, and/or zinc were detected in the soil samples collected from SB-2 (2.0-3.0 feet bgs), SB-3 (4.0-5.0 feet bgs), SB-4 (3.0-4.0 feet bgs), SB-6 (2.0-3.0 feet bgs), and SB-8 (6.0-7.0 feet bgs) above SDBLs, but below the most restrictive Part 201 Residential cleanup criteria. No concentrations of metals were detected in any of the remaining soil samples collected above laboratory MDLs and/or SDBLs.

## 2.2 Summary of Groundwater Analytical Results

### 2.2.1 Summary of Previous Groundwater Analytical Results

Relevant figures and tables from Summit and ECI's 2008 Phase II ESA are included in Appendix A.

No concentrations of VOCs and PNAs were detected in the groundwater samples collected in 2008 above laboratory MDLs.

Concentrations of arsenic and/or lead were detected in all six of the 2008 groundwater samples collected (TMW1 through TMW5, and TMW12) above the Part 201 Residential and Nonresidential DW and/or Groundwater Surface Water Interface (GSI) cleanup criteria. No other concentrations of metals were detected in the groundwater samples collected in 2008 above laboratory MDLs and/or the most restrictive Part 201 Residential cleanup criteria.

### 2.2.2 Summary of Current Groundwater Analytical Results

PM's January 2016 groundwater analytical results are summarized on Figure 4 and in Table 3.

No concentrations of VOCs and PNAs were detected in the groundwater samples collected above laboratory MDLs.

Concentrations of arsenic were detected in the groundwater samples collected from TMW-1 and TMW-5 above the Part 201 Residential and Nonresidential DW and GSI cleanup criteria. Concentrations of arsenic, barium and/or zinc were detected in all five of the groundwater samples collected (TMW-1, TMW-3, TMW-5, TMW-7, and TMW-9) above laboratory MDLs, but below the most restrictive Part 201 Residential cleanup criteria. No other concentrations of metals were detected in the groundwater samples collected from the subject property above laboratory MDLs.

# 3.0 EXPOSURE PATHWAY EVALUATION

The following exposure pathways were evaluated, including: groundwater ingestion, soil leaching to groundwater, groundwater surface water interface, direct contact, and ambient and indoor air inhalation from contaminated soil and groundwater. Exposure pathways are eliminated when it

is demonstrated that unacceptable exposures do not exist and that response activities are not required to prevent or mitigate unacceptable exposures.

The subject property is currently zoned B-3: General Business District, which is consistent with a Nonresidential property use in accordance with Part 201. Therefore, the Part 201 Nonresidential cleanup criteria are applicable for the subject property's current zoning.

| HUMAN EXPOSURE PATHWAYS | | | | |
|---|---|---|---|---|
| **Pathway** | **Exposure Pathway Relevant?** | | **If Pathway Is Relevant, Are Applicable Criteria Exceeded? (Nonresidential)** | |
| | **Yes/ No** | **Justification** | **Soil** | **Groundwater** |
| Groundwater Ingestion | No | • Municipal water<br>• No water wells on the subject property | NA | NA |
| Indoor Air Inhalation | Yes | • No exceedance of the cleanup criteria | No | No |
| Ambient Air Inhalation | Yes | • No exceedance of the cleanup criteria | No | No |
| Direct Contact | Yes | • No exceedance of the Nonresidential DC cleanup criteria* | No | No |

NA - Not applicable
* If changes to the property use, operations, and/or layout occur that would result in residential use, re-evaluation of potential exposure pathways and associated amendments to this report will be required.

| OTHER PATHWAYS AND DUE CARE CONSIDERATIONS | |
|---|---|
| Migration Via Utility Corridors | Utility corridors on or adjacent to the subject property may represent pathways for contaminant migration; **Utility corridors may additionally act as a conduit for vapor and direct contact exposures to third parties completing subsurface work.** Based on the lack of target analytes in exceedance of Part 201 Nonresidential SVII and DC cleanup criteria, no exposure is anticipated. |
| Fire and Explosion Hazards | No current compounds were identified above the flammability and explosively screening level and no non-aqueous phase liquid (NAPL) was identified. |

## 4.0 PLAN FOR RESPONSE ACTIVITY

Concentrations of arsenic above the Part 201 Residential DC cleanup criteria have been documented in the 2008 soil sample collected from B2-1 (6.0 feet bgs) and the 2016 soil sample collected from SB-3 (4.0-5.0 feet bgs) in the northern portion of the subject property. However, no target analytes were identified above Part 201 Nonresidential cleanup criteria requiring response activities to prevent unacceptable exposure to hazardous substances for site occupants and onsite subsurface workers, based on the current and intended nonresidential use of the property. However, activities to comply with Section 7a, as outlined in Section 5.0 and 6.0, are still required.

The property is currently zoned for Nonresidential use; therefore, if changes to the property use, operations, and/or layout occur that would result in residential use, re-evaluation of potential exposure pathways and associated amendments to this report will be required.

## 5.0 CONSTRUCTION MANAGEMENT

Redevelopment of the property is anticipated; therefore, the following construction management actions will be conducted to prevent unacceptable exposure to hazardous substances for onsite subsurface workers and allow for the intended use of the subject property in a manner that protects the public's health and safety.

- All potential third party contractors who may work sub-grade on the subject property will be notified of the presence of soil contaminants and that site-specific health and safety plans and/or requirements for 40-hour personal protection and safety training are necessary if working in the impacted area of the subject property.

- Subject property workers will adhere to a site specific health and safety plan in accordance with OSHA 29 CFR 1910.120 Worker Protection Regulations, and will practice management actions for impacted soil on the subject property during construction related actions.

- Prior to any excavation or intrusive activity, including but not limited to the installation of building footings, sub-grade utilities, or other similar features, an evaluation of the potential hazardous substances in soil and groundwater will be under taken to assure protection of persons who may come into direct contact with contaminated soil and/or groundwater. Evaluation activities will include review of this DDCC, and available environmental reports.

- Contaminated soil and groundwater will not be relocated or removed from the subject property for proper disposal or moved from one portion of the subject property to another without proper characterization and/or appropriate notices in accordance with Section 20c of Part 201, and/or the use of engineering controls (i.e., liners, surface cover, etc.).

- In the event that previously unknown sources of contamination are discovered on the subject property during redevelopment and construction activities, an appropriate course of action will be implemented to evaluate the nature of the source, the extent of the contamination as feasible, and the appropriate course of action to prevent unacceptable exposure to subject property occupants and onsite workers, and prevent exacerbation of existing contamination. Unknown structures, such as USTs, drums or other containers will be evaluated for content and removed from the subject property, as appropriate.

- An environmental professional may be present during the construction activities.

## 6.0 EVALUATION AND DEMONSTRATION OF COMPLIANCE WITH SECTION 7AOBLIGATIONS

The following sections provide documentation that the proposed usage of the site will be in compliance with Section 7A obligations.

Concentrations of arsenic above the Part 201 Residential DC cleanup criteria have been documented in the 2008 soil sample collected from B2-1 (6.0 feet bgs) and the 2016 soil sample collected from SB-3 (4.0-5.0 feet bgs) in the northern portion of the subject property. Therefore, as indicated in Section 4.0, if changes to the property use, operations, and/or layout occur that would result in residential use, the surface cover will be maintained and include annual

inspections of the condition of the surface cover, which will consist of at least four inches of concrete or asphalt.

In the event the property owner or occupant intends to move soil, proper characterization is to be conducted to prevent movement of impact soils to un-impacted areas or offsite.

### 6.1 Exacerbation (Section 7a(1)(a))

Redevelopment activities are anticipated that could result in exacerbation if proper management activities are not completed. Activities outlined in Section 5.0 will be employed to control exposure during construction activities. Soil and/or groundwater in impacted areas will be characterized to allow proper management of contaminated media as identified. Soil control measures will be planned and implemented in a manner as to not increase offsite migration along subsurface utility, sewer, or structure corridors.

### 6.2 Due Care (Section 7a(1)(b))

Based on the current and anticipated use and analytical results, due care response activities will not be required to prevent unacceptable exposure for the intended use of the property. Activities outlined in Section 5.0 will be employed to control exposure during construction activities.

- If changes to the proposed property use, zoning, operations, and/or layout occur, re-evaluation of potential exposure pathways and associated amendments to this report will be required.

- The subject property is currently connected to municipal water, but the owner will assure the groundwater on the property is not utilized for any purpose.

### 6.3 Reasonable Precautions (Section 7a(1)(c))

Reasonable precautions will be taken against the reasonable foreseeable acts or omissions of a third party and the consequences that are foreseeable could result from those acts or omissions. These include the following:

- All potential third party contractors who may work sub-grade on the subject property will be notified of the presence of soil and/or groundwater contaminants and that site-specific health and safety plans and/or requirements for 40-hour personal protection and safety training are necessary if working in the impacted area of the subject property. The owner will provide prospective future owners with the existing documentation, including this DDCC and the February 2016 BEA concerning the existing subsurface contamination.

- Activities outlined in Section 5.0 will be employed to control exposure during construction activities.

### 6.4 Reasonable Cooperation, Assistance, and Access (Section 7a(1)(d))

Reasonable cooperation, assistance, and access will be provided to the persons (i.e. including liable parties) that are authorized to conduct response activities at the facility, including the cooperation and access necessary for the installation, integrity, operation, and maintenance of any complete or partial response activity at the facility.

### 6.5 Use Restriction Compliance (Section 7a(1)(e))

No land use or resource use restrictions are known or required in connection with the planned response activities at the property.

In the event that any land use or resource use restriction is placed on the property, the owner will comply with them.

### 6.6 Effectiveness or Integrity of Use Restrictions (Section 7a(1)(f))

As indicated in Section 6.5, no land use or resource use restrictions are known or required in connection with the planned response activities at the property.

If any land use or resource use restriction is placed on the property, the effectiveness and integrity of the land use or resource restrictions employed at the property will not be impeded.

## 7.0 DUE CARE DOCUMENTATION

Documentation, including this report, is to be maintained for the subject property, demonstrating that the subject property is in compliance with Section 7a of Part 201. This report and any requested compliance documentation must be made available to the MDEQ upon request. Compliance documentation includes, but is not limited to the following:

- Documentation of subsurface construction activities in impacted areas, including any soil or groundwater sampling/characterization reports and waste disposal manifests.

If you have questions regarding this report, please contact PM at 248.336.9988.

**REPORT PREPARED BY:**

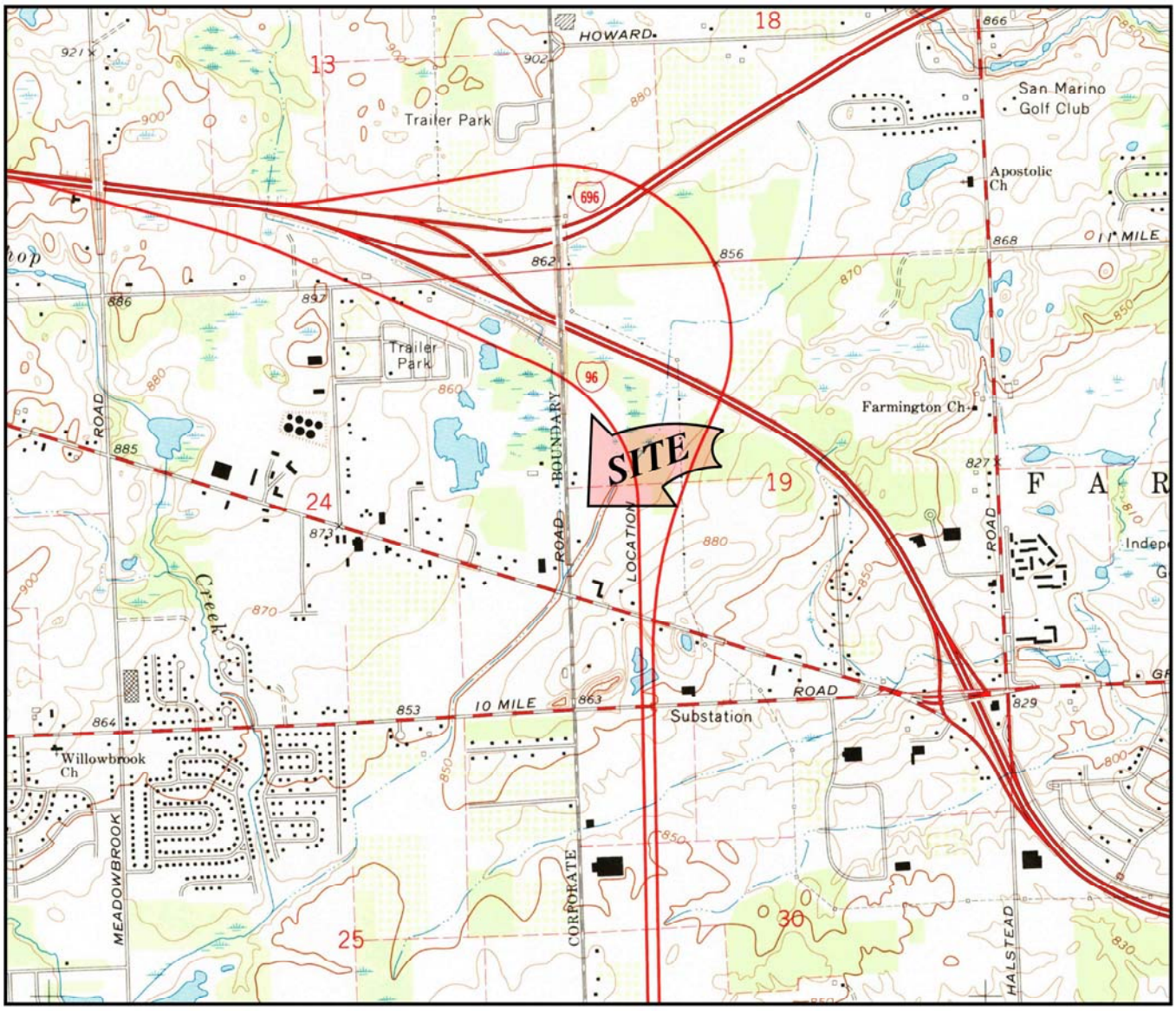
Aaron Snow
Staff Scientist

**REPORT REVIEWED BY:**

Jennifer Ritchie, CPG
Regional Manager

# Figures

PM ENVIRONMENTAL Environmental & Engineering Services





# OAKLAND COUNTY

SCALE 1:24,000

1 MILE 1/2 MILE 0 1 MILE

FIGURE 1

**PROPERTY VICINITY MAP**

**USGS, 7.5 MINUTE SERIES**

**NORTHVILLE, MI QUADRANGLE, 1969. PHOTO REVISED 1971.**

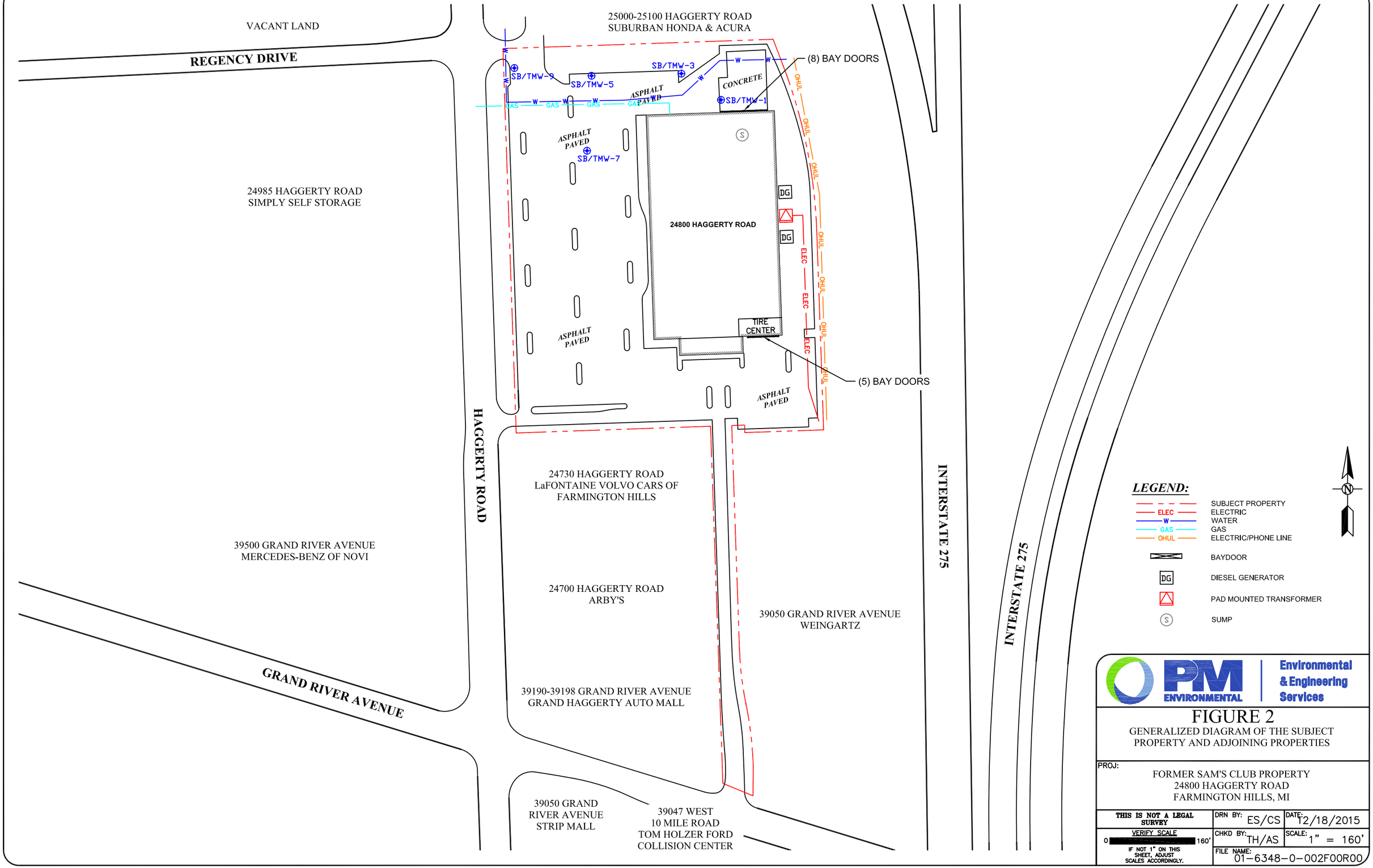
PM ENVIRONMENTAL | Environmental & Engineering Services

PROJ:
FORMER SAM'S CLUB PROPERTY
24800 HAGGERTY ROAD
FARMINGTON HILLS, MI

THIS IS NOT A LEGAL SURVEY

VERIFY SCALE
0 2,000'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRN BY: ES
DATE: 12/7/2015
CHKD BY: TH
SCALE: 1" = 2,000'
FILE NAME: 01-6348-0-002F01R00




PM ENVIRONMENTAL | Environmental & Engineering Services

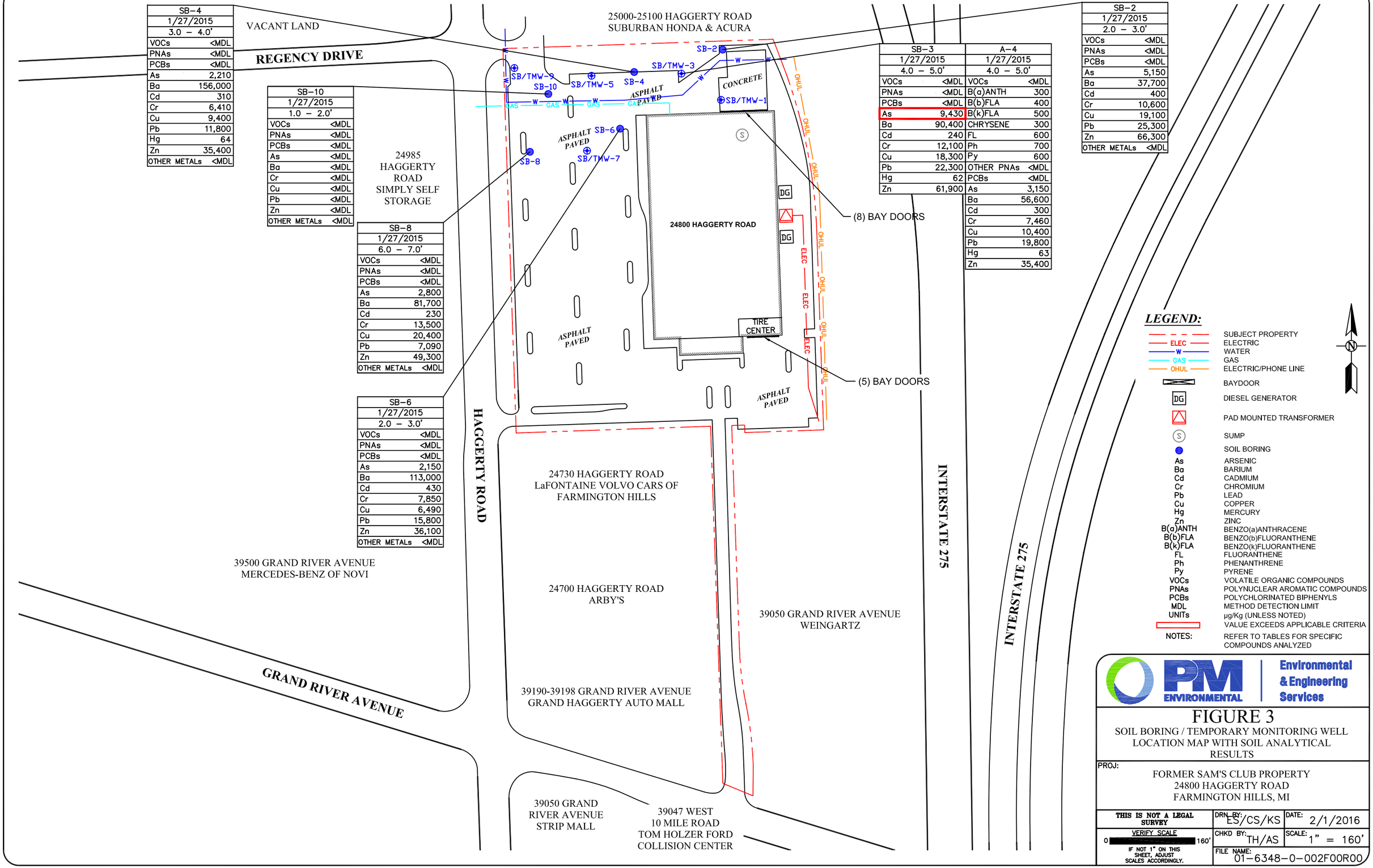
# FIGURE 2

GENERALIZED DIAGRAM OF THE SUBJECT PROPERTY AND ADJOINING PROPERTIES

PROJ:

FORMER SAM'S CLUB PROPERTY
24800 HAGGERTY ROAD
FARMINGTON HILLS, MI

| | | |
|---|---|---|
| THIS IS NOT A LEGAL SURVEY | DRN BY: ES/CS | DATE: 12/18/2015 |
| VERIFY SCALE 0 — 160' IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY. | CHKD BY: TH/AS | SCALE: 1" = 160' |
| | FILE NAME: 01-6348-0-002F00R00 | |


SB–4
1/27/2015
3.0 – 4.0'
VOCs <MDL
PNAs <MDL
PCBs <MDL
As 2,210
Ba 156,000
Cd 310
Cr 6,410
Cu 9,400
Pb 11,800
Hg 64
Zn 35,400
OTHER METALs <MDL
VACANT LAND
REGENCY DRIVE
SB–10
1/27/2015
1.0 – 2.0'
VOCs <MDL
PNAs <MDL
PCBs <MDL
As <MDL
Ba <MDL
Cr <MDL
Cu <MDL
Pb <MDL
Zn <MDL
OTHER METALs <MDL
24985 HAGGERTY ROAD SIMPLY SELF STORAGE
SB–8
1/27/2015
6.0 – 7.0'
VOCs <MDL
PNAs <MDL
PCBs <MDL
As 2,800
Ba 81,700
Cd 230
Cr 13,500
Cu 20,400
Pb 7,090
Zn 49,300
OTHER METALs <MDL
SB–6
1/27/2015
2.0 – 3.0'
VOCs <MDL
PNAs <MDL
PCBs <MDL
As 2,150
Ba 113,000
Cd 430
Cr 7,850
Cu 6,490
Pb 15,800
Zn 36,100
OTHER METALs <MDL
39500 GRAND RIVER AVENUE
MERCEDES-BENZ OF NOVI
GRAND RIVER AVENUE
HAGGERTY ROAD
25000-25100 HAGGERTY ROAD
SUBURBAN HONDA & ACURA
SB-2
SB/TMW-9
SB/TMW-5
SB-4
SB/TMW-3
SB-10
SB-6
SB-8
SB/TMW-7
SB/TMW-1
ASPHALT PAVED
CONCRETE
W
GAS
OHUL
ELEC
DG
24800 HAGGERTY ROAD
TIRE CENTER
(8) BAY DOORS
(5) BAY DOORS
24730 HAGGERTY ROAD
LaFONTAINE VOLVO CARS OF
FARMINGTON HILLS
24700 HAGGERTY ROAD
ARBY'S
39190-39198 GRAND RIVER AVENUE
GRAND HAGGERTY AUTO MALL
39050 GRAND
RIVER AVENUE
STRIP MALL
39047 WEST
10 MILE ROAD
TOM HOLZER FORD
COLLISION CENTER
39050 GRAND RIVER AVENUE
WEINGARTZ
INTERSTATE 275
SB–3
1/27/2015
4.0 – 5.0'
VOCs <MDL
PNAs <MDL
PCBs <MDL
As 9,430
Ba 90,400
Cd 240
Cr 12,100
Cu 18,300
Pb 22,300
Hg 62
Zn 61,900
A–4
1/27/2015
4.0 – 5.0'
VOCs <MDL
B(a)ANTH 300
B(b)FLA 400
B(k)FLA 500
CHRYSENE 300
FL 600
Ph 700
Py 600
OTHER PNAs <MDL
PCBs <MDL
As 3,150
Ba 56,600
Cd 300
Cr 7,460
Cu 10,400
Pb 19,800
Hg 63
Zn 35,400
SB–2
1/27/2015
2.0 – 3.0'
VOCs <MDL
PNAs <MDL
PCBs <MDL
As 5,150
Ba 37,700
Cd 400
Cr 10,600
Cu 19,100
Pb 25,300
Zn 66,300
OTHER METALs <MDL
LEGEND:
SUBJECT PROPERTY
ELEC ELECTRIC
W WATER
GAS GAS
OHUL ELECTRIC/PHONE LINE
BAYDOOR
DG DIESEL GENERATOR
PAD MOUNTED TRANSFORMER
S SUMP
SOIL BORING
As ARSENIC
Ba BARIUM
Cd CADMIUM
Cr CHROMIUM
Pb LEAD
Cu COPPER
Hg MERCURY
Zn ZINC
B(a)ANTH BENZO(a)ANTHRACENE
B(b)FLA BENZO(b)FLUORANTHENE
B(k)FLA BENZO(k)FLUORANTHENE
FL FLUORANTHENE
Ph PHENANTHRENE
Py PYRENE
VOCs VOLATILE ORGANIC COMPOUNDS
PNAs POLYNUCLEAR AROMATIC COMPOUNDS
PCBs POLYCHLORINATED BIPHENYLS
MDL METHOD DETECTION LIMIT
UNITs µg/Kg (UNLESS NOTED)
VALUE EXCEEDS APPLICABLE CRITERIA
NOTES: REFER TO TABLES FOR SPECIFIC COMPOUNDS ANALYZED
N
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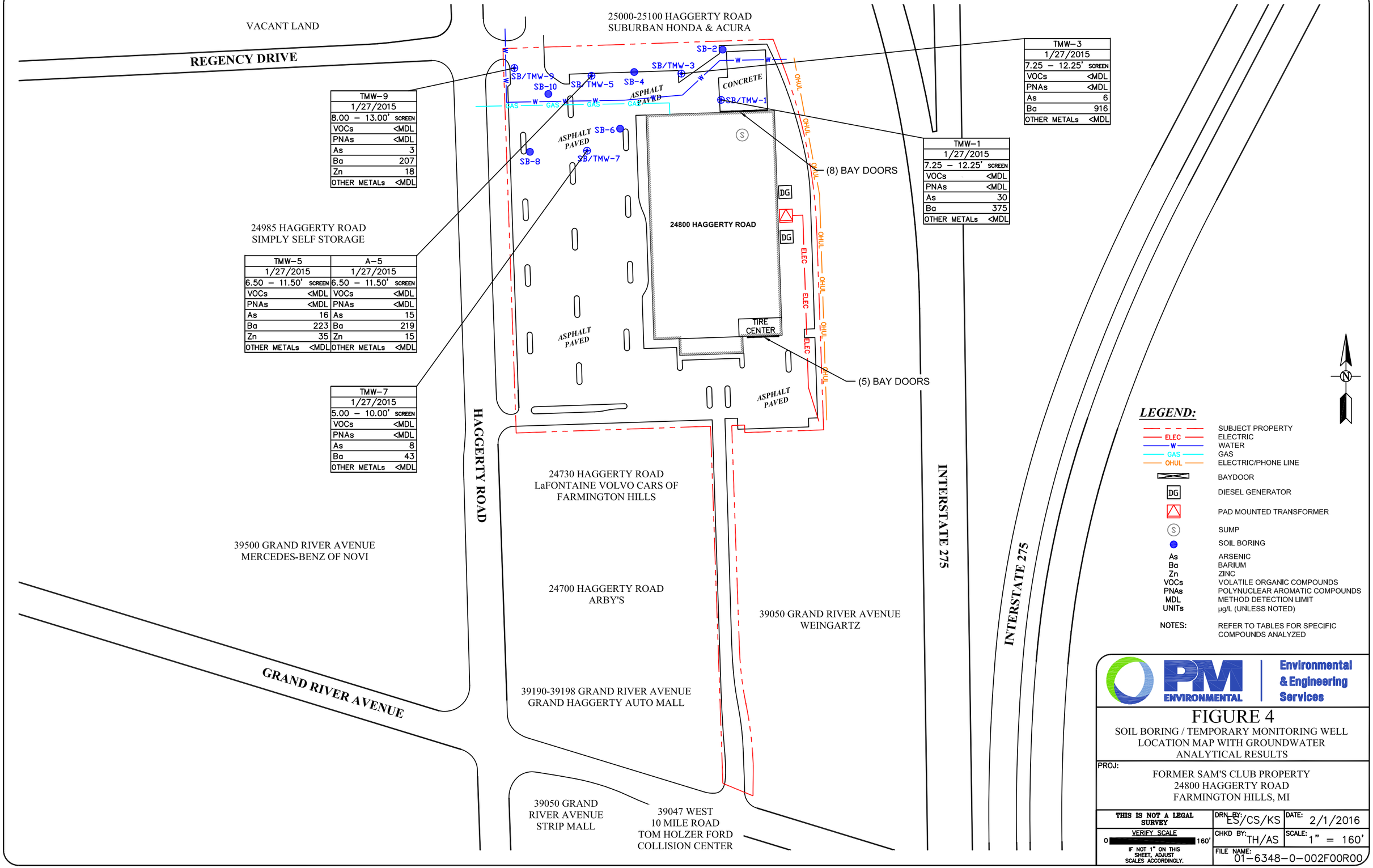
Environmental & Engineering Services
FIGURE 3
SOIL BORING / TEMPORARY MONITORING WELL LOCATION MAP WITH SOIL ANALYTICAL RESULTS
PROJ:
FORMER SAM'S CLUB PROPERTY
24800 HAGGERTY ROAD
FARMINGTON HILLS, MI
THIS IS NOT A LEGAL SURVEY
VERIFY SCALE
0 160'
IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY.
DRN BY: ES/CS/KS
DATE: 2/1/2016
CHKD BY: TH/AS
SCALE: 1" = 160'
FILE NAME: 01-6348-0-002F00R00




PM ENVIRONMENTAL | Environmental & Engineering Services

# FIGURE 4

SOIL BORING / TEMPORARY MONITORING WELL LOCATION MAP WITH GROUNDWATER ANALYTICAL RESULTS

PROJ:
FORMER SAM'S CLUB PROPERTY
24800 HAGGERTY ROAD
FARMINGTON HILLS, MI

| | | |
|---|---|---|
| THIS IS NOT A LEGAL SURVEY | DRN BY: ES/CS/KS | DATE: 2/1/2016 |
| VERIFY SCALE 0 — 160' IF NOT 1" ON THIS SHEET, ADJUST SCALES ACCORDINGLY. | CHKD BY: TH/AS | SCALE: 1" = 160' |
| | FILE NAME: 01-6348-0-002F00R00 | |

# Tables

PM ENVIRONMENTAL Environmental & Engineering Services

**TABLE 1**
**SUMMARY OF SOIL ANALYTICAL RESULTS: VOCs, PNAs, AND PCBs**
**24800 HAGGERTY ROAD, FARMINGTON HILLS, MICHIGAN**
**PM PROJECT # 01-6348-0-002**

| **VOLATILE ORGANIC COMPOUNDS (VOCs), POLYNUCLEAR AROMATIC HYDROCARBONS (PNAs), AND POLYCHLORINATED BIPHENYLS (PCBs) (µg/Kg)** | | | VOCs | Benzo(a)anthracene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Chrysene | Fluoranthene | Phenanthrene | Pyrene | Other PNAs | PCBs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Chemical Abstract Service Number (CAS#)** | | | Various | 56553 | 205992 | 207089 | 218019 | 206440 | 85018 | 129000 | Various | 1336363 |
| **Sample ID** | **Sample Date** | **Sample Depth (feet bgs)** | **VOCs** | **PNAs** | | | | | | | | **PCBs** |
| SB-2 | 01/27/2016 | 2.0-3.0 | <MDL | <300 | <300 | <300 | <300 | <300 | <300 | <300 | <MDL | <330 |
| SB-3 | 01/27/2016 | 4.0-5.0 | <MDL | <300 | <300 | <300 | <300 | <300 | <300 | <300 | <MDL | <330 |
| A-4 (Co-located SB-3) | | | <MDL | 300 | 400 | 500 | 300 | 600 | 700 | 600 | <MDL | <330 |
| SB-4 | 01/27/2016 | 3.0-4.0 | <MDL | <300 | <300 | <300 | <300 | <300 | <300 | <300 | <MDL | <330 |
| SB-6 | 01/27/2016 | 2.0-3.0 | <MDL | <300 | <300 | <300 | <300 | <300 | <300 | <300 | <MDL | <330 |
| SB-8 | 01/27/2016 | 6.0-7.0 | <MDL | <300 | <300 | <300 | <300 | <300 | <300 | <300 | <MDL | <330 |
| SB-10 | 01/27/2016 | 1.0-2.0 | <MDL | <300 | <300 | <300 | <300 | <300 | <300 | <300 | <MDL | <330 |
| **Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50)<br>Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013<br>MDEQ Guidance Document For The Vapor Intrusion Pathway, Policy and Procedure Number: 09-017, Appendix D Vapor Intrusion Screening Values, May 2013** | | | | | | | | | | | | |
| **Residential (µg/Kg)** | | | | | | | | | | | | |
| **Drinking Water Protection (Res DWP)** | | | Various | NLL | NLL | NLL | NLL | 7.30E+05 | 56,000 | 4.80E+05 | Various | NLL |
| **Groundwater Surface Water Interface Protection (GSIP)** | | | Various | NLL | NLL | NLL | NLL | 5,500 | 2,100 | ID | Various | NLL |
| **Soil Volatilization to Indoor Air Inhalation (Res SVII)** | | | Various | NLV | ID | NLV | ID | 1.0E+9 {D} | 2.8E+06 | 1.0E+9 {D} | Various | 3.0E+06 |
| **Ambient Air Infinite Source Volatile Soil Inhalation (Res VSI)** | | | Various | NLV | ID | NLV | ID | 7.40E+08 | 1.6E+05 | 6.5E+08 | Various | 2.40E+05 |
| **Ambient Air Finite VSI for 5 Meter Source Thickness** | | | Various | NLV | ID | NLV | ID | 7.4E+08 | 1.6E+05 | 6.5E+08 | Various | 7.9E+06 |
| **Ambient Air Finite VSI for 2 Meter Source Thickness** | | | Various | NLV | ID | NLV | ID | 7.4E+08 | 1.6E+05 | 6.5E+08 | Various | 7.9E+06 |
| **Ambient Air Particulate Soil Inhalation (Res PSI)** | | | Various | ID | ID | ID | ID | 9.3E+09 | 6.7E+06 | 6.7E+09 | Various | 5.2E+06 |
| **Direct Contact (Res DC)** | | | Various | 20,000 | 20,000 | 2.00E+05 | 2.0E+06 | 4.6E+07 | 1.6E+06 | 2.9E+07 | Various | {T} |
| **Nonresidential (µg/Kg)** | | | | | | | | | | | | |
| **Drinking Water Protection (Nonres DWP)** | | | Various | NLL | NLL | NLL | NLL | 7.30E+05 | 1.60E+05 | 4.80E+05 | Various | NLL |
| **Soil Volatilization to Indoor Air Inhalation (Nonres SVII)** | | | Various | NLV | ID | NLV | ID | 1.0E+9 {D} | 5.1E+06 | 1.0E+9 {D} | Various | 1.6E+07 |
| **Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)** | | | Various | NLV | ID | NLV | ID | 8.9E+08 | 1.90E+05 | 7.8E+08 | Various | 8.10E+05 |
| **Ambient Air Finite VSI for 5 Meter Source Thickness** | | | Various | NLV | ID | NLV | ID | 8.8E+08 | 1.90E+05 | 7.8E+08 | Various | 2.8E+07 |
| **Ambient Air Finite VSI for 2 Meter Source Thickness** | | | Various | NLV | ID | NLV | ID | 8.8E+08 | 1.90E+05 | 7.8E+08 | Various | 2.8E+07 |
| **Ambient Air Particulate Soil Inhalation (Nonres PSI)** | | | Various | ID | ID | ID | ID | 4.1E+09 | 2.9E+06 | 2.9E+09 | Various | 6.5E+06 |
| **Direct Contact (Nonres DC)** | | | Various | 80,000 | 80,000 | 8.00E+05 | 8.0E+06 | 1.3E+08 | 5.2E+06 | 8.4E+07 | Various | {T} |
| **Screening Levels (µg/Kg)** | | | | | | | | | | | | |
| **Soil Saturation Concentration Screening Levels (Csat)** | | | Various | NA | NA | NA | NA | NA | NA | NA | Various | NA |
| **Residential Vapor Intrusion Soil Screening Levels ($S_{VI\text{-}res}$)** | | | Various | NL | NL | NL | NL | NL | 5,100 | 6.5E+07 | Various | 1,900 |
| **Nonresidential Vapor Intrusion Soil Screening Levels ($S_{VI\text{-}nr}$)** | | | Various | NL | NL | NL | NL | NL | 86,000 | 1.09E+09 | Various | 39,000 |

| | |
|---|---|
| | Applicable Criterion/RBSL Exceeded |
| **BOLD** | Value Exceeds Applicable Criterion/RBSL |
| bgs | Below Ground Surface (feet) |
| <MDL | Non-detected at levels above laboratory method detection limit (MDL) |
| NA | Not Applicable |
| NL | Not Listed |
| NLL | Not Likely to Leach |
| NLV | Not Likely to Volatilize |
| ID | Insufficient Data |

**TABLE 2**
**SUMMARY OF SOIL ANALYTICAL RESULTS: METALS**
**24800 HAGGERTY ROAD, FARMINGTON HILLS, MICHIGAN**
**PM PROJECT # 01-6348-0-002**

| METALS (µg/Kg) | | | Arsenic | Barium | Cadmium | Chromium | Copper | Lead | Mercury | Selenium | Silver | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Chemical Abstract Service Number (CAS#)** | | | 7440382 | 7440393 | 7440439 | 16065831 | 7440508 | 7439921 | 7439976 | 7782492 | 7440224 | 7440666 |
| **Sample ID** | **Sample Date** | **Sample Depth (feet bgs)** | **Michigan Ten Metals** | | | | | | | | | |
| SB-2 | 01/27/2016 | 2.0-3.0 | 5,150 | 37,700 | 400 | 10,600 | 19,100 | 25,300 | <50 | <400 | <200 | 66,300 |
| SB-3 | 01/27/2016 | 4.0-5.0 | **9,430** | 90,400 | 240 | 12,100 | 18,300 | 22,300 | 62 | <400 | <200 | 61,900 |
| A-4 (Co-located SB-3) | | | 3,150 | 56,600 | 300 | 7,460 | 10,400 | 19,800 | 63 | <400 | <200 | 35,400 |
| SB-4 | 01/27/2016 | 3.0-4.0 | 2,210 | 156,000 | 310 | 6,410 | 9,400 | 11,800 | 64 | <400 | <200 | 35,400 |
| SB-6 | 01/27/2016 | 2.0-3.0 | 2,150 | 113,000 | 430 | 7,850 | 6,490 | 15,800 | <50 | <400 | <200 | 36,100 |
| SB-8 | 01/27/2016 | 6.0-7.0 | 2,800 | 81,700 | 230 | 13,500 | 20,400 | 7,090 | <50 | <400 | <200 | 49,300 |
| SB-10 | 01/27/2016 | 1.0-2.0 | 2,980 | 28,200 | <200 | 5,850 | 9,970 | 8,200 | <50 | <400 | <200 | 21,700 |
| **Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50)**<br>**Generic Soil Cleanup Criteria Tables 2 and 3: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013**<br>**MDEQ Guidance Document For The Vapor Intrusion Pathway, Policy and Procedure Number: 09-017, Appendix D Vapor Intrusion Screening Values, May 2013** | | | | | | | | | | | | |
| **Residential (µg/Kg)** | | | | | | | | | | | | |
| **Statewide Default Background Levels** | | | 5,800 | 75,000 | 1,200 | 18,000 | 32,000 | 21,000 | 130 | 410 | 1,000 | 47,000 |
| **Drinking Water Protection (DWP)** | | | 4,600 | 1.30E+06 | 6,000 | 30,000 | 5.80E+06 | 7.00E+05 | 1,700 | 4,000 | 4,500 | 2.40E+06 |
| **Groundwater Surface Water Interface Protection (GSIP)** | | | 4,600 | 1.2E+06{G} | 7,200 {G,X} | 6.3E+09 | 1.6E+05 {G} | 7.4E+06 {G,X} | 50 {M}; 1.2 | 400 | 100 {M}; 27 | 3.6E+05 {G} |
| **Soil Volatilization to Indoor Air Inhalation (SVII)** | | | NLV | NLV | NLV | NLV | NLV | NLV | 48,000 | NLV | NLV | NLV |
| **Ambient Air Infinite Source Volatile Soil Inhalation (VSI)** | | | NLV | NLV | NLV | NLV | NLV | NLV | 52,000 | NLV | NLV | NLV |
| **Ambient Air Finite VSI for 5 Meter Source Thickness** | | | NLV | NLV | NLV | NLV | NLV | NLV | 52,000 | NLV | NLV | NLV |
| **Ambient Air Finite VSI for 2 Meter Source Thickness** | | | NLV | NLV | NLV | NLV | NLV | NLV | 52,000 | NLV | NLV | NLV |
| **Ambient Air Particulate Soil Inhalation (PSI)** | | | 7.20E+05 | 3.30E+08 | 1.70E+06 | 2.60E+05 | 1.30E+08 | 1.00E+08 | 2.00E+07 | 1.30E+08 | 6.70E+06 | ID |
| **Direct Contact (DC)** | | | 7,600 | 3.70E+07 | 5.50E+05 | 2.50E+06 | 2.00E+07 | 4.00E+05 | 1.60E+05 | 2.60E+06 | 2.50E+06 | 1.70E+08 |
| **Nonresidential (µg/Kg)** | | | | | | | | | | | | |
| **Drinking Water Protection (Nonres DWP)** | | | 4,600 | 1.30E+06 | 6,000 | 30,000 | 5.80E+06 | 7.00E+05 | 1,700 | 4,000 | 4,500 | 5.00E+06 |
| **Soil Volatilization to Indoor Air Inhalation (Nonres SVII)** | | | NLV | NLV | NLV | NLV | NLV | NLV | 89,000 | NLV | NLV | NLV |
| **Ambient Air Infinite Source Volatile Soil Inhalation (Nonres VSI)** | | | NLV | NLV | NLV | NLV | NLV | NLV | 62,000 | NLV | NLV | NLV |
| **Ambient Air Finite VSI for 5 Meter Source Thickness** | | | NLV | NLV | NLV | NLV | NLV | NLV | 62,000 | NLV | NLV | NLV |
| **Ambient Air Finite VSI for 2 Meter Source Thickness** | | | NLV | NLV | NLV | NLV | NLV | NLV | 62,000 | NLV | NLV | NLV |
| **Ambient Air Particulate Soil Inhalation (Nonres PSI)** | | | 9.10E+05 | 1.50E+08 | 2.20E+06 | 2.40E+05 | 5.90E+07 | 4.40E+07 | 8.80E+06 | 5.90E+07 | 2.90E+06 | ID |
| **Direct Contact (Nonres DC)** | | | 37,000 | 1.30E+08 | 2.10E+06 | 9.20E+06 | 7.30E+07 | 9.0E+5 (DD) | 5.80E+05 | 9.60E+06 | 9.00E+06 | 6.30E+08 |
| **Screening Levels (µg/Kg)** | | | | | | | | | | | | |
| **Soil Saturation Concentration Screening Levels (Csat)** | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **Residential Vapor Intrusion Soil Screening Levels ($S_{VI\text{-}res}$)** | | | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL |
| **Nonresidential Vapor Intrusion Soil Screening Levels ($S_{VI\text{-}nr}$)** | | | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL |

Applicable Criterion/RBSL Exceeded
**BOLD** Value Exceeds Applicable Criterion/RBSL
bgs Below Ground Surface (feet)
<MDL Non-detected at levels above laboratory method detection limit (MDL)
NA Not Applicable
NL Not Listed
NLL Not Likely to Leach
NLV Not Likely to Volatilize
ID Insufficient Data

{G} Metal GSIP Criteria for Surface Water Not Protected for Drinking Water Use based on 377 mg/L CaCO3 Hardness: Station ID 630002, Minnow Pond Drain, near Farmington Township, MI.

**TABLE3**
**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS: VOCs, PNAs, AND METALS**
**24800 HAGGERTY ROAD, FARMINGTON HILLS, MICHIGAN**
**PM PROJECT # 01-6348-0-002**

| VOLATILE ORGANIC COMPOUNDS (VOCs), POLYNUCLEAR AROMATIC HYDROCARBONS (PNAs), AND METALS (µg/L) | | | | VOCs | PNAs | Arsenic | Barium | Cadmium | Chromium | Copper | Lead | Mercury | Selenium | Silver | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Chemical Abstract Service Number (CAS#)** | | | | Various | Various | 7440382 | 7440393 | 7440439 | 16065831 | 7440508 | 7439921 | 7439976 | 7782492 | 7440224 | 7440666 |
| **Sample ID** | **Sample Date** | **Screen Depth (feet bgs)** | **Depth to Groundwater (feet bgs)** | **VOCs** | **PNAs** | **Michigan Ten Metals** | | | | | | | | | |
| TMW-1 | 01/27/2016 | 7.25-12.25 | 8.65 | ND | ND | 30 | 375 | <0.5 | <5 | <5 | <3 | <0.2 | <5 | <0.5 | <5 |
| TMW-3 | 01/27/2016 | 7.75-12.75 | 8.27 | ND | ND | 6 | 916 | <0.5 | <5 | <5 | <3 | <0.2 | <5 | <0.5 | <5 |
| TMW-5 | 01/27/2016 | 6.50-11.50 | 6.81 | ND | ND | 16 | 223 | <0.5 | <5 | <5 | <3 | <0.2 | <5 | <0.5 | 35 |
| A-5 (Co-located TMW-5) | | | | ND | ND | 15 | 219 | <0.5 | <5 | <5 | <3 | <0.2 | <5 | <0.5 | 15 |
| TMW-7 | 01/27/2016 | 5.00-10.00 | 6.60 | ND | ND | 8 | 43 | <0.5 | <5 | <5 | <3 | <0.2 | <5 | <0.5 | <5 |
| TMW-9 | 01/27/2016 | 8.00-13.00 | 8.40 | ND | ND | 3 | 207 | <0.5 | <5 | <5 | <3 | <0.2 | <5 | <0.5 | 18 |
| **Cleanup Criteria Requirements for Response Activity (R 299.1 - R 299.50)**<br>**Generic Groundwater Cleanup Criteria Table 1: Residential and Non-Residential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels, December 30, 2013**<br>**MDEQ Guidance Document For The Vapor Intrusion Pathway, Policy and Procedure Number: 09-017, Appendix D Vapor Intrusion Screening Values, May 2013** | | | | | | | | | | | | | | | |
| **Residential/Nonresidential (µg/L)** | | | | | | | | | | | | | | | |
| **Residential Drinking Water (Res DW)** | | | | Various | Various | 10 {A} | 2,000 {A} | 5.0 {A} | 100 {A} | 1,000 {E} | 4.0 {L} | 2.0 {A} | 50 {A} | 34 | 2,400 |
| **Residential Health Based Drinking Water Values** | | | | Various | Various | NL | NL | NL | NL | 1,400 {E} | NL | NL | NL | NL | NL |
| **Nonresidential Drinking Water (Nonres DW)** | | | | Various | Various | 10 {A} | 2,000 {A} | 5.0 {A} | 100 {A} | 1,000 {E} | 4.0 {L} | 2.0 {A} | 50 {A} | 98 | 5,000 {E} |
| **Nonresidential Health Based Drinking Water Values** | | | | Various | Various | NL | NL | NL | NL | 4,000 {E} | NL | NL | NL | NL | NL |
| **Groundwater Surface Water Interface (GSI)** | | | | Various | Various | 10 | 1,800 {G} | 6 {G,X} | 220 | 28 {G} | 42 {G,X} | 0.0013 | 5.0 | 0.2 {M}; 0.06 | 360 {G} |
| **Residential Groundwater Volatilization to Indoor Air Inhalation (Res GVII)** [1] | | | | Various | Various | NLV | NLV | NLV | NLV | NLV | NLV | 56 {S} | NLV | NLV | NLV |
| **Nonresidential Groundwater Volatilization to Indoor Air Inhalation (Nonres GVII)** [1] | | | | Various | Various | NLV | NLV | NLV | NLV | NLV | NLV | 56 {S} | NLV | NLV | NLV |
| **Screening Levels (µg/L)** | | | | | | | | | | | | | | | |
| **Residential Groundwater Vapor Intrusion Screening Levels ($GW_{VI\text{-}res}$)** [2] | | | | Various | Various | NL | NL | NL | NL | NL | NL | ID | NL | NL | NL |
| **Nonresidential Groundwater Vapor Intrusion Screening Levels ($GW_{VI\text{-}nr}$)** [2] | | | | Various | Various | NL | NL | NL | NL | NL | NL | ID | NL | NL | NL |
| **Residential Vapor Intrusion Shallow Groundwater Screening Levels ($GW_{VI\text{-}sump\text{-}res}$)** [3] | | | | Various | Various | NL | NL | NL | NL | NL | NL | ID | NL | NL | NL |
| **Nonresidential Vapor Intrusion Shallow Groundwater Screening Levels ($GW_{VI\text{-}sump\text{-}nr}$)** [3] | | | | Various | Various | NL | NL | NL | NL | NL | NL | ID | NL | NL | NL |
| **Water Solubility** | | | | Various | Various | NA | NA | NA | NA | NA | NA | 56 | NA | NA | NA |
| **Flammability and Explosivity Screening Level** | | | | Various | Various | ID | ID | ID | ID | ID | ID | ID | ID | ID | ID |
| **Acute Vapor Intrusion Screening Levels for Groundwater (µg/L)** | | | | | | | | | | | | | | | |
| **IRASL Groundwater ($AGW_{vi}$)** | | | | Various | Various | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL |
| **IRASL Groundwater In Contact With Structure ($AGW_{vi\text{-}sump}$)** | | | | Various | Various | NL | NL | NL | NL | NL | NL | NL | NL | NL | NL |

Applicable Criteria/RBSL Exceeded

**BOLD** Value Exceeds Applicable Criteria

bgs Below Ground Surface (feet)

ND Not detected at levels above the laboratory Method Detection Limit (MDL) or Minimum Quantitative Level (MQL)

[1] Tier 1 GVII Criteria based on 3 meter (or greater) groundwater depth

[2] (2013 Vapor Intrusion Guidance) Screening Levels based on depth to groundwater less than 1.5 meters and not in contact with building foundation

[3] (2013 Vapor Intrusion Guidance) Screening levels based on groundwater in contact with the building foundation or within a sump

NA Not Applicable

NL Not Listed

NLL Not Likely to Leach

NLV Not Likely to Volatilize

ID Insufficient Data

{G} Metal GSI Criteria for Surface Water Not Protected for Drinking Water Use based on 377 mg/L CaCO3 Hardness: Station ID 630002, Minnow Pond Drain, near Farmington Township, MI.

# Appendix A

PM ENVIRONMENTAL Environmental & Engineering Services

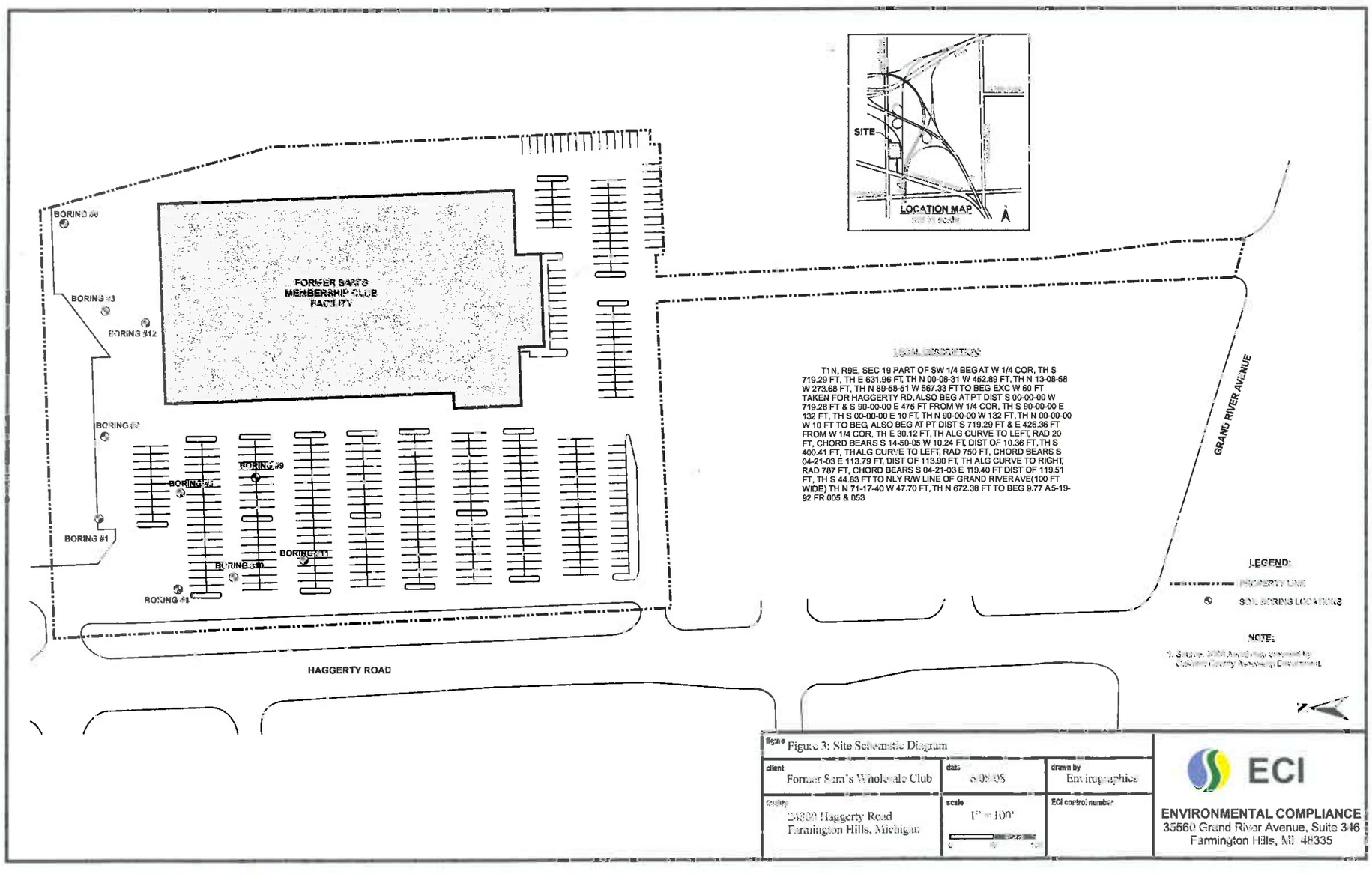



Figure 3: Site Schematic Diagram

| | | |
|---|---|---|
| client: Former Sam's Wholesale Club | date: 8/09/05 | drawn by: Envirographics |
| facility: 24809 Haggerty Road, Farmington Hills, Michigan | scale: 1" = 100' | ECI control number: |

ECI
ENVIRONMENTAL COMPLIANCE
35560 Grand River Avenue, Suite 346
Farmington Hills, MI 48335

## Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Shaded cells indicate the criteria exceeded.

| Site/Facility/Incident Former Sam's Club | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory Results | | | Soil: Residential and Commercial I. Part 201 Generic Cleanup Criteria and Screening Levels; Part 213 Tier 1 Risk-Based Screening Levels (RBSLs) | | | | | | | | | | | | | |
| | | | | Groundwater Protection | | | | Indoor Air | Source size modifier: 0.35 | | | | | Direct Contact | | |
| | | | Statewide Default Background Levels | Drinking Water Protection and RBSLs | Groundwater Surface Water Interface Protection Criteria and RBSLs (may not be protective for Drinking Water Sources) (1) | Groundwater Surface Water Interface Protection Criteria and RBSLs (protective for Drinking Water Sources) (1) | Groundwater Contact Protection Criteria and RBSLs | Soil Volatilization to Indoor Air Inhalation Criteria and RBSLs | Infinite Source Volatile Soil Inhalation Criteria (VISC) and RBSLs | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria and RBSLs | Direct Contact Criteria and RBSLs | Soil Saturation Concentration Screening Levels | | |
| **B12-5/1/2008 12:00** | | | | | | | | | | | | | | | | |
| **Parameter** | **Results (ug/Kg)** | **Qual** | | | | | | | | | | | | | | |
| Lead (B) | 38,000 | | | 7.0E+5 | (G,X) | CALC | ID | NLV | NLV | NLV | NLV | 1.0E+8 | 4.0E+5 | NA | | |
| Zinc (B) | 58,000 | | | 2.4E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.7E+8 | NA | | |
| **B2-1 Soil @6ft-5/1/2008 10:00:00 AM** | | | | | | | | | | | | | | | | |
| **Parameter** | **Results (ug/Kg)** | **Qual** | | | | | | | | | | | | | | |
| Arsenic | 11,000 | | | | 70,000 (X) | 23,000 | 2.0E+6 | NLV | NLV | NLV | NLV | 7.2E+5 | | NA | | |
| Barium (B) | 96,000 | | | 1.3E+6 | (G,X) | CALC | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 3.3E+8 | 3.7E+7 | NA | | |
| Zinc (B) | 58,000 | | | 2.4E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.7E+8 | NA | | |
| **B2-2 3.5ft Soil-5/1/2008 12:00** | | | | | | | | | | | | | | | | |
| **Parameter** | **Results (ug/Kg)** | **Qual** | | | | | | | | | | | | | | |
| Barium (B) | 140,000 | | | 1.3E+6 | (G,X) | CALC | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 3.3E+8 | 3.7E+7 | NA | | |
| Zinc (B) | 55,000 | | | 2.4E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.7E+8 | NA | | |
| **B3-1 Soil @7ft-5/1/2008 12:00** | | | | | | | | | | | | | | | | |
| **Parameter** | **Results (ug/Kg)** | **Qual** | | | | | | | | | | | | | | |
| Arsenic | 6,500 | | | | 70,000 (X) | 23,000 | 2.0E+6 | NLV | NLV | NLV | NLV | 7.2E+5 | 7,600 | NA | | |
| Barium (B) | 160,000 | | | 1.3E+6 | (G,X) | CALC | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 3.3E+8 | 3.7E+7 | NA | | |
| Copper (B) | 39,000 | | | 5.8E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 1.3E+8 | 2.0E+7 | NA | | |
| Lead (B) | 54,000 | | | 7.0E+5 | (G,X) | CALC | ID | NLV | NLV | NLV | NLV | 1.0E+8 | 4.0E+5 | NA | | |
| Mercury, Total | 180 | | | 1,700 | | | 47,000 | 48,000 | 52,000 | 52,000 | 52,000 | 2.0E+7 | 1.6E+5 | NA | | |
| Naphthalene | 2,200 | | NA | 35,000 | | | 2.1E+6 | 2.5E+5 | 3.0E+5 | 3.0E+5 | 3.0E+5 | 2.0E+8 | 1.6E+7 | NA | | |
| Selenium (B) | 1,700 | | | 4,000 | | | 7.8E+7 | NLV | NLV | NLV | NLV | 1.3E+8 | 2.6E+6 | NA | | |
| 1,2,4-Trimethylbenzene (I) | 1,900 | | NA | 2,100 | | | 1.1E+5 (C) | 1.1E+5 (C) | 2.1E+7 | 5.0E+8 | 5.0E+8 | 8.2E+10 | 1.1E+5 (C) | 1.1E+5 | | |
| Zinc (B) | 150,000 | | | 2.4E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.7E+8 | NA | | |
| **B4-1 Soil @3-4ft-5/1/2008 12:00** | | | | | | | | | | | | | | | | |
| **Parameter** | **Results (ug/Kg)** | **Qual** | | | | | | | | | | | | | | |
| Lead (B) | 22,000 | | | 7.0E+5 | (G,X) | CALC | ID | NLV | NLV | NLV | NLV | 1.0E+8 | 4.0E+5 | NA | | |
| Zinc (B) | 52,000 | | | 2.4E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.7E+8 | NA | | |
| **B5-1 Soil @3-4ft-5/1/2008 12:00** | | | | | | | | | | | | | | | | |
| **Parameter** | **Results (ug/Kg)** | **Qual** | | | | | | | | | | | | | | |
| Barium (B) | 89,000 | | | 1.3E+6 | (G,X) | CALC | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 3.3E+8 | 3.7E+7 | NA | | |

## Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Shaded cells indicate the criteria exceeded.

**Site/Facility/Incident Former Sam's Club**

| Laboratory Results | | | Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels; Part 213 Tier Risk-Based Screening levels (RBSLs) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Residential and Commercial I DW Criteria And RBSLs | Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs | Groundwater Surface Water Interface Criteria And RBSLs (may not be protective of DW) | Groundwater Surface Water Interface Criteria And RBSLs (protective of DW) | Residential and Commercial I Groundwater Volatilization to Indoor Air Inhalation Criteria and RBSLs | Industrial and Commercial II III and IV Groundwater Volatilization to Indoor Air Inhalation Criteria and RBSLs | Groundwater Contact Criteria and RBSLs | Water Solubility | Flammability and Explosivity Screening Level | Acute Inhalation Screening Level |
| **TMW1 Water (14ft)-5/1/2008 12:00** | | | | | | | | | | | | |
| **Parameter** | **Result** | **Qual** | | | | | | | | | | |
| Arsenic | 24 | | 10 (A) | 10 (A) | 150 (X) | 50 | NLV | NLV | 4,300 | NA | ID | ID |
| **TMW12 Water (14ft)-5/1/2008 12:00** | | | | | | | | | | | | |
| **Parameter** | **Result** | **Qual** | | | | | | | | | | |
| Arsenic | 62 | | 10 (A) | 10 (A) | 150 (X) | 50 | NLV | NLV | 4,300 | NA | ID | ID |
| Chromium, Total | 13 | | 100 (A) | 100 (A) | 11 | | NLV | NLV | 4.6E+5 | NA | ID | ID |
| Lead (B) | 8.1 | | 4.0 (L) | 4.0 (L) | (G,X) | 14 CALC | NLV | NLV | ID | NA | ID | ID |
| **TMW2 Water (14ft)-5/1/2008 12:00** | | | | | | | | | | | | |
| **Parameter** | **Result** | **Qual** | | | | | | | | | | |
| Arsenic | 12 | | 10 (A) | 10 (A) | 150 (X) | 50 | NLV | NLV | 4,300 | NA | ID | ID |
| **TMW3 Water (14ft)-5/1/2008 12:00** | | | | | | | | | | | | |
| **Parameter** | **Result** | **Qual** | | | | | | | | | | |
| Arsenic | 50 | | 10 (A) | 10 (A) | 150 (X) | 50 | NLV | NLV | 4,300 | NA | ID | ID |
| **TMW4 Water (14ft)-5/1/2008 12:00** | | | | | | | | | | | | |
| **Parameter** | **Result** | **Qual** | | | | | | | | | | |
| Arsenic | 11 | | 10 (A) | 10 (A) | 150 (X) | 50 | NLV | NLV | 4,300 | NA | ID | ID |
| Chromium, Total | 13 | | 100 (A) | 100 (A) | 11 | | NLV | NLV | 4.6E+5 | NA | ID | ID |
| Lead (B) | 7.5 | | 4.0 (L) | 4.0 (L) | (G,X) | 14 CALC | NLV | NLV | ID | NA | ID | ID |
| **TMW5 Water (14ft)-5/1/2008 12:00** | | | | | | | | | | | | |
| **Parameter** | **Result** | **Qual** | | | | | | | | | | |
| Arsenic | 23 | | 10 (A) | 10 (A) | 150 (X) | 50 | NLV | NLV | 4,300 | NA | ID | ID |
| Lead (B) | 5.4 | | 4.0 (L) | 4.0 (L) | (G,X) | 14 CALC | NLV | NLV | ID | NA | ID | ID |
| **TMW8 Water (14ft)-5/1/2008 12:00** | | | | | | | | | | | | |
| **Parameter** | **Result** | **Qual** | | | | | | | | | | |
| Arsenic | 24 | | 10 (A) | 10 (A) | 150 (X) | 50 | NLV | NLV | 4,300 | NA | ID | ID |
| Lead (B) | 4.2 | | 4.0 (L) | 4.0 (L) | (G,X) | 14 CALC | NLV | NLV | ID | NA | ID | ID |

## Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Darker or blue shaded cells for the criteria indicate the chemical was found at a concentration that exceeds at least one criterion. Lighter or yellow shaded cells indicate the compound was not detected, but the reporting limit was above the criteria.

### Site/Facility/Incident Former Sam's Club

| Laboratory Results | | | Soil: Residential and Commercial I. Part 201 Generic Cleanup Criteria and Screening Levels; Part 213 Tier 1 Risk-Based Screening Levels (RBSLs) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Groundwater Protection | | | | Indoor Air | Source size modifier: 0.35 | | | | Direct Contact | | |
| | | | Statewide Default Background Levels | Drinking Water Protection Criteria and RBSLs | Groundwater Surface Water Protection Criteria and RBSLs (may not be protective for Drinking Water Sources) (1) | Groundwater Surface Water Protection Criteria and RBSLs (protective for Drinking Water Sources) (1) | Groundwater Contact Protection Criteria and RBSLs | Soil Volatilization to Indoor Air Inhalation and RBSLs | Infinite Source Volatile Soil Inhalation Criteria (VISC) and RBSLs | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria and RBSLs | Direct Contact Criteria and RBSLs | Soil Saturation Concentration Sceening Levels | |
| **B10 Sandy Soil (5-6ft)-5/1/2008 12:00** | | | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | | | |
| **Parameter** | **Result (ug/Kg)** | **Qual** | | | | | | | | | | | | | |
| Arsenic | 6,[illegible] | | [illegible] | [illegible] | 70,000 (X) | 23,000 | 2.0E+6 | NLV | NLV | NLV | NLV | 7.2E+5 | 7,600 | NA | |
| Barium (B) | 19,000 | | 75,000 | 1.3E+6 | (G,X) | CALC | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 3.3E+8 | 3.7E+7 | NA | |
| Cadmium (B) | 81 | | 1,200 | 6,000 | (G,X) | CALC | 2.3E+8 | NLV | NLV | NLV | NLV | 1.7E+6 | 5.5E+5 | NA | |
| Chromium, Total | 9,500 | | 18,000 (total) | 30,000 | 18000 | | 1.4E+8 | NLV | NLV | NLV | NLV | 2.6E+5 | 2.5E+6 | NA | |
| Copper (B) | 14,000 | | 32,000 | 5.8E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 1.3E+8 | 2.0E+7 | NA | |
| Lead (B) | 5,100 | | 21,000 | 7.0E+5 | (G,X) | CALC | ID | NLV | NLV | NLV | NLV | 1.0E+8 | 4.0E+5 | NA | |
| Mercury, Total | < 50 | | 130 | 1,700 | 130 (M); 1.2 | | 47,000 | 48,000 | 52,000 | 52,000 | 52,000 | 2.0E+7 | 1.6E+5 | NA | |
| Selenium (B) | 210 | | 410 | 4,000 | 410 | | 7.8E+7 | NLV | NLV | NLV | NLV | 1.3E+8 | 2.6E+6 | NA | |
| Silver (B) | < 100 | | 1,000 | 4,500 | 1000 (M); 27 | | 2.0E+8 | NLV | NLV | NLV | NLV | 6.7E+6 | 2.5E+6 | NA | |
| Zinc (B) | 24,000 | | 47,000 | 2.4E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.7E+8 | NA | |
| **B11 Sandy Soil (4-5ft)-5/1/2008 12:00** | | | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | | | |
| **Parameter** | **Result (ug/Kg)** | **Qual** | | | | | | | | | | | | | |
| Arsenic | 1,900 | | 5,800 | 5800 | 70,000 (X) | 23,000 | 2.0E+6 | NLV | NLV | NLV | NLV | 7.2E+5 | 7,600 | NA | |
| Barium (B) | 6,100 | | 75,000 | 1.3E+6 | (G,X) | CALC | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 3.3E+8 | 3.7E+7 | NA | |
| Cadmium (B) | 77 | | 1,200 | 6,000 | (G,X) | CALC | 2.3E+8 | NLV | NLV | NLV | NLV | 1.7E+6 | 5.5E+5 | NA | |
| Chromium, Total | 5,000 | | 18,000 (total) | 30,000 | 18000 | | 1.4E+8 | NLV | NLV | NLV | NLV | 2.6E+5 | 2.5E+6 | NA | |
| Copper (B) | 8,600 | | 32,000 | 5.8E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 1.3E+8 | 2.0E+7 | NA | |
| Lead (B) | 3,100 | | 21,000 | 7.0E+5 | (G,X) | CALC | ID | NLV | NLV | NLV | NLV | 1.0E+8 | 4.0E+5 | NA | |
| Mercury, Total | < 50 | | 130 | 1,700 | 130 (M); 1.2 | | 47,000 | 48,000 | 52,000 | 52,000 | 52,000 | 2.0E+7 | 1.6E+5 | NA | |
| Selenium (B) | 340 | | 410 | 4,000 | 410 | | 7.8E+7 | NLV | NLV | NLV | NLV | 1.3E+8 | 2.6E+6 | NA | |
| Silver (B) | < 100 | | 1,000 | 4,500 | 1000 (M); 27 | | 2.0E+8 | NLV | NLV | NLV | NLV | 6.7E+6 | 2.5E+6 | NA | |
| Zinc (B) | 15,000 | | 47,000 | 2.4E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.7E+8 | NA | |
| **B6-1 Sandy Soil (6ft)-5/1/2008 12:00** | | | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | | | |
| **Parameter** | **Result (ug/Kg)** | **Qual** | | | | | | | | | | | | | |
| Arsenic | 3,600 | | 5,800 | 5800 | 70,000 (X) | 23,000 | 2.0E+6 | NLV | NLV | NLV | NLV | 7.2E+5 | 7,600 | NA | |
| Barium (B) | 22,000 | | 75,000 | 1.3E+6 | (G,X) | CALC | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 3.3E+8 | 3.7E+7 | NA | |
| Cadmium (B) | 130 | | 1,200 | 6,000 | (G,X) | CALC | 2.3E+8 | NLV | NLV | NLV | NLV | 1.7E+6 | 5.5E+5 | NA | |
| Chromium, Total | 11,000 | | 18,000 (total) | 30,000 | 18000 | | 1.4E+8 | NLV | NLV | NLV | NLV | 2.6E+5 | 2.5E+6 | NA | |
| Copper (B) | 12,000 | | 32,000 | 5.8E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 1.3E+8 | 2.0E+7 | NA | |
| Lead (B) | 6,800 | | 21,000 | 7.0E+5 | (G,X) | CALC | ID | NLV | NLV | NLV | NLV | 1.0E+8 | 4.0E+5 | NA | |
| Mercury, Total | < 50 | | 130 | 1,700 | 130 (M); 1.2 | | 47,000 | 48,000 | 52,000 | 52,000 | 52,000 | 2.0E+7 | 1.6E+5 | NA | |
| Selenium (B) | < 200 | | 410 | 4,000 | 410 | | 7.8E+7 | NLV | NLV | NLV | NLV | 1.3E+8 | 2.6E+6 | NA | |
| Silver (B) | < 100 | | 1,000 | 4,500 | 1000 (M); 27 | | 2.0E+8 | NLV | NLV | NLV | NLV | 6.7E+6 | 2.5E+6 | NA | |
| Zinc (B) | 36,000 | | 47,000 | 2.4E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.7E+8 | NA | |
| **B9 Sandy Soil (7-8ft)-5/1/2008 12:00** | | | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | | | |
| **Parameter** | **Result (ug/Kg)** | **Qual** | | | | | | | | | | | | | |
| Arsenic | 2,300 | | 5,800 | 5800 | 70,000 (X) | 23,000 | 2.0E+6 | NLV | NLV | NLV | NLV | 7.2E+5 | 7,600 | NA | |
| Barium (B) | 13,000 | | 75,000 | 1.3E+6 | (G,X) | CALC | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 3.3E+8 | 3.7E+7 | NA | |
| Cadmium (B) | 74 | | 1,200 | 6,000 | (G,X) | CALC | 2.3E+8 | NLV | NLV | NLV | NLV | 1.7E+6 | 5.5E+5 | NA | |

## Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Darker or blue shaded cells for the criteria indicate the chemical was found at a concentration that exceeds at least one criterion. Lighter or yellow shaded cells indicate the compound was not detected, but the reporting limit was above the criteria.

### Site/Facility/Incident Former Sam's Club

| Laboratory Results | | | Soil: Residential and Commercial I. Part 201 Generic Cleanup Criteria and Screening Levels; Part 213 Tier 1 Risk-Based Screening Levels (RBSLs) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Groundwater Protection | | | | Indoor Air | Source size modifier: 0.35 | | | | Direct Contact | | |
| | | | Statewide Default Background Levels | Drinking Water Protection Criteria and RBSLs | Groundwater Surface Water Protection Criteria and RBSLs (may not be protective for Drinking Water Sources) (1) | Groundwater Surface Water Protection Criteria and RBSLs (protective for Drinking Water Sources) (1) | Groundwater Contact Protection Criteria and RBSLs | Soil Volatilization to Indoor Air Inhalation and RBSLs | Infinite Source Volatile Soil Inhalation Criteria (VISC) and RBSLs | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria and RBSLs | Direct Contact Criteria and RBSLs | Soil Saturation Concentration Sceening Levels | |
| **B9 Sandy Soil (7-8ft)-5/1/2008 12:00** | | | | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | | | | |
| **Parameter** | **Result (ug/Kg)** | **Qual** | | | | | | | | | | | | | |
| Chromium, Total | 4,300 | | 18,000 (total) | 30,000 | 18000 | | 1.4E+8 | NLV | NLV | NLV | NLV | 2.6E+5 | 2.5E+6 | NA | |
| Copper (B) | 6,500 | | 32,000 | 5.8E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 1.3E+8 | 2.0E+7 | NA | |
| Lead (B) | 2,900 | | 21,000 | 7.0E+5 | (G,X) | CALC | ID | NLV | NLV | NLV | NLV | 1.0E+8 | 4.0E+5 | NA | |
| Mercury, Total | < 50 | | 130 | 1,700 | 130 (M); 1.2 | | 47,000 | 48,000 | 52,000 | 52,000 | 52,000 | 2.0E+7 | 1.6E+5 | NA | |
| Selenium (B) | 210 | | 410 | 4,000 | 410 | | 7.8E+7 | NLV | NLV | NLV | NLV | 1.3E+8 | 2.6E+6 | NA | |
| Silver (B) | < 100 | | 1,000 | 4,500 | 1000 (M); 27 | | 2.0E+8 | NLV | NLV | NLV | NLV | 6.7E+6 | 2.5E+6 | NA | |
| Zinc (B) | 16,000 | | 47,000 | 2.4E+6 | (G) | | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.7E+8 | NA | |

Some criteria in the table may show two values with a footnote (M). This occurs when the calculated criterion for the respective land use and pathway is below the target detection limit or TDL (see OM#2, Attachment 1 and foonote M in OM#1, Attachment 1.). In such cases the criterion defaults to the TDL. The first value is the default criterion and the last value the calculated criterion.

More than one result may be reported by the laboratory for the same parameter. ( different methods are used for the same parameter)

A ph of 7 and hardness of 100 were used to calculate GSI generic criteria for some parameters

Valence-specific chromium data (Cr III and IV) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

Statewide defaults for metals and cyanide were used to replace some criteria.

Some criteria in the table may show two values with a footnote (M). This occurs when the calculated criterion for the respective land use and pathway is below the target detection limit or TDL (see OM#2, Attachment 1 and foonote M in OM#1, Attachment 1.). In such cases the criterion defaults to the TDL. The first value is the default criterion and the last value the calculated criterion.

More than one result may be reported by the laboratory for the same parameter. ( different methods are used for the same parameter)

A ph of 7 and hardness of 100 were used to calculate GSI generic criteria for some parameters

Valence-specific chromium data (Cr III and IV) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

Statewide defaults for metals and cyanide were used to replace some criteria.

## Comparison of Laboratory Results to Part 201 Generic Cleanup Criteria and Screening Levels

Darker or blue shaded cells for the criteria indicate the chemical was found at a concentration that exceeds at least one criterion. Lighter or yellow shaded cells indicate the compound was not detected, but the reporting limit was above the criteria

**Site/Facility/Incident Former Sam's Club**

| Laboratory Results | | | Groundwater: Residential and Industrial-Commercial Part 201 Generic Cleanup Criteria and Screening Levels; Part 213 Tier Risk-Based Screening levels (RBSLs) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Residential and Commercial I Drinking Water Criteria And RBSLs | Industrial and Commercial II, III,IV Drinking Water Criteria and RSBLs | Groundwater Surface Water Interface Criteria And RBSLs (may not be protective for Drinking Water Sources) (1) | Groundwater Surface Water Interface Criteria And RBSLs (protective for Drinking Water Sources) (1) | Residential and Commercial I Groundwater Volatilization to Indoor Air Inhalation Criteria and RBSLs | Industrial and Commercial II III and IV Groundwater Volatilization to Indoor Air Inhalation Criteria and RBSLs | Groundwater Contact Criteria and RBSLs | Water Solubility | Flammability and Explosivity Screening Level | Acute Inhalation Screening Level |
| **SAMPLE:** B2-1 Soil @6ft-5/1/2008 10:00:00 AM | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | |
| **Parameter** | **Result (ug/L)** | **Qual.** | | | | | | | | | | |
| Barium (B) | 390 | | 2,000 (A) | 2,000 (A) | (G,X) | 1,900 CALC | NLV | NLV | 1.4E+7 | NA | ID | ID |
| Chromium, Total | 13 | | 100 (A) | 100 (A) | [illegible] | | NLV | NLV | 4.6E+5 | NA | ID | ID |
| Copper (B) | 11 | | 1,000 (E) | 1,000 (E) | (G) | | NLV | NLV | 7.4E+6 | NA | ID | ID |
| Lead (B) | 5 | | [illegible] | [illegible] | (G,X) | 14 CALC | NLV | NLV | ID | NA | ID | ID |
| **SAMPLE:** B3-1 Soil @7ft-5/1/2008 12:00 | | | | | | | | | | | | |
| **Metals** | | | | | | | | | | | | |
| **Parameter** | **Result (ug/L)** | **Qual.** | | | | | | | | | | |
| Arsenic | 6.7 | | 10 (A) | 10 (A) | 150 (X) | 50 | NLV | NLV | 4,300 | NA | ID | ID |
| Barium (B) | 370 | | 2,000 (A) | 2,000 (A) | (G,X) | 1,900 CALC | NLV | NLV | 1.4E+7 | NA | ID | ID |
| Chromium, Total | 12 | | 100 (A) | 100 (A) | [illegible] | | NLV | NLV | 4.6E+5 | NA | ID | ID |
| Copper (B) | 15 | | 1,000 (E) | 1,000 (E) | (G) | | NLV | NLV | 7.4E+6 | NA | ID | ID |
| Lead (B) | 13 | | [illegible] | [illegible] | (G,X) | 14 CALC | NLV | NLV | ID | NA | ID | ID |
| Zinc (B) | 250 | | 2,400 | 5,000 (E) | (G) | | NLV | NLV | 1.1E+8 | NA | ID | ID |

Total concentrations must be used when possible for comparisons to cleanup criteria and RBSLs. The use of dissolved constituents for comparison to criteria must be approved by the RRD.

Some criteria in the table may show two values with a footnote (M). This occurs when the calculated criterion for the respective land use and pathway is below the target detection limit or TDL (see OM#2, Attachment 1 and foonote M in OM#1, Attachment 1.). In such cases the criterion defaults to the TDL. The first value is the default criterion and the last value the calculated criterion.

More than one result may be reported by the laboratory for the same parameter. ( different methods are used for the same parameter)

A ph of 7 and hardness of 100 were used to calculate GSI generic criteria for some parameters

Valence-specific chromium data (Cr III and IV) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

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